

REMARKS

I. OVERVIEW

The claims of the application feature covering a target area with tiles arranged in an aperiodic pattern, whereas the prior art discloses an approach for selecting a rotated pattern that appears on the surface of a tile.

II. DISCUSSION OF THE CLAIMS OF THE APPLICATION

All of the Claims of the application feature *covering a target area* (or a target region) *with tiles arranged in an aperiodic pattern*. As noted in the application on page 11, there are several known aperiodic tiling patterns. FIG. 4 of the application provides an example of an aperiodic pattern that is used to arrange textured tiles 404' and 406' to cover target area 402. Textured tiles 404' and 406' are created by mapping aperiodic tiles 404 and 406 onto a textured image area 408.

The use of an aperiodic pattern eliminates the discernable sub-patterns that are visible when a periodic pattern is used. For example, in FIG. 2B, the periodic pattern used to arrange the tiles to cover the target area results in visible patterns, whereas in FIG. 5, the aperiodic pattern used to arrange the tiles to cover the target area precludes such visible patterns.

Because the claims of the application are concerned with covering a desired area in an aperiodic tiling pattern with tiles that are generated from a textured image, the specific details about the pattern on the surface of the tiles, including whether or not the surface pattern is rotated or how the surface pattern is selected, is not pertinent to the claims in the application.

III. DISCUSSION OF THE PRIOR ART - *Jensen*

U.S. Patent No. 5,956,043 issued to Jensen ("*Jensen*") is generally directed to an approach for generating a tile that has a rotated pattern on the surface of the tile. (Abstract). A tile with a rotated pattern on the surface is referred to in *Jensen* as "a rotated textured tile." (Abstract). More particularly, *Jensen* is directed to selecting a tile with a rotated pattern on the surface of the tile so that when the tile is used to cover a region according to a periodic tiling pattern, the seams between the tiles are not visible as a result of discontinuities in the pattern on the surface of adjacent tiles. (Col. 3, lines 9-19).

FIG. 9 of *Jensen* shows the problem of the prior art that arises when a periodic tiling pattern to cover a region using tile that has a rotated pattern. The seam between the two subtiles 800 is clearly visible because the pattern on the surface of the left subtile does not match the pattern on the surface of the right subtile at the boundary 904.

Jensen overcomes the problem of the visible seams between tiles with a rotated pattern on their surfaces by using an iterative procedure to select a rotated textured tile having a rotated pattern on its surface that is cut from a larger, rotated supertile. Specifically, *Jensen* uses an unrotated tile to create a supertile and then rotates the supertile through an angle. (Abstract, FIG. 11 through FIG. 14). A period along each axis is selected by moving a window along each axis and comparing the pixels in the window to a reference window. (Abstract) Once a suitable match is found between the pixels in the moving window and the reference window, a period is defined for the axis as the distance between position of the reference window and the position of the moving window where the match is found. (Col. 8, lines 1-10; Col. 9, lines 20-25).

After a period is defined for each axis, the rotated textured tile is formed by cutting a tile from the rotated supertile. The resulting tile has dimensions that correspond to the period for each axis (e.g., a width equal to the X period and a height equal to the Y period). (Col. 10, lines 1-3). The rotated textured tile of the selected dimensions is cut from the supertile at the position corresponding to the window positions that are used to define the periods for each axis. (Col. 10, lines 3-5).

The selection of a particular pattern for the surface of the final rotated textured tile is how *Jensen* overcomes the problem of visible seams between tiles that are arranged in a periodic pattern to cover an area. Thus, when the final rotated textured tile is arranged in a periodic pattern, the resulting surface pattern on the tiles is the same as the surface pattern of the rotated supertile shown in FIG. 14.

IV. CONTRASTING THE CLAIMS WITH THE PRIOR ART

The claims of the present application feature covering a target area by arranging tiles (which are generated from a texture image) in an aperiodic pattern so that visible patterns are eliminated. In contrast, the disclosure of *Jensen* is directed to an approach for selecting a rotated pattern for the surface of a tile so that when the tile is arranged in a periodic pattern there are no visible seams between the tiles due to discontinuities in the patterns on the surfaces of the tiles.

If the rotated textured tile of *Jensen* were to be arranged in an aperiodic pattern, the seams between the tiles would be visible. Discontinuities between the patterns on the surfaces of adjacent tiles would appear because *Jensen* compares the sliding window to a reference window to find a match between the patterns shown in the two windows. The point at which the two windows have matching patterns defines where the pattern along an axis repeats. In other words,

the approach of *Jensen* is successful in eliminating visible seams between tiles because the pattern selected for the surface of the final rotated textured tile is periodic. If the pattern selected for the surface of the final rotated texture tile were not periodic, the discontinuities would appear between adjacent tiles.

Even if the disclosure of *Jensen* were understood to suggest the use of different tiles having different sizes and orientations to cover an area, the seams between the tiles would again be visible due to discontinuities in the patterns on the surfaces of the tiles. The discontinuities would arise because the different tiles would be cut from different portions of the rotated supertile, and there would be nothing to ensure that the patterns at the boundaries of such different tiles would match. The discontinuities would also arise between tiles of the same size but with different orientations because the pattern on the tiles would not be oriented in the same direction.

Furthermore, the use of different tiles with different sizes and shapes would lead to problems in how to cover an area because there is nothing to ensure that the differing tiles would properly fit together to cover the area. In contrast, as shown in FIG. 4 of the application, the aperiodic tiles 404 and 406 and the aperiodic pattern of arranging textured tiles 404' and 406' are defined such that the tiles fit together to cover the target area 402.

In summary, the claims present application feature *covering a target area according to an aperiodic tiling pattern with tiles* generated from a texture image, so that visible patterns are eliminated. In contrast, *Jensen* discloses an approach for *selecting a rotated pattern for the surface of a tile* so that when the tile is repeated in a periodic pattern, seams between the tiles are not visible. Therefore, the Applicant respectfully submits that the prior art does not disclose,

teach, suggest, or render obvious the covering a target area by arranging tiles in an aperiodic pattern, as required by the Claims.

V. CONCLUSION

For at least the reasons set forth above, the Applicant respectfully submits that all of the pending claims are patentable over the cited art and are in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

To the extent necessary, an additional petition for an extension of time under 37 C.F.R. § 1.136 beyond the petition above for a one (1) month extension is hereby made. Please charge any shortages in fees due in connection with the filing of this paper, including additional extension of time fees, or credit any overages to Deposit Account No. 50-1302.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

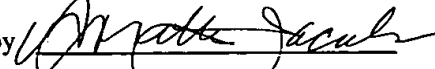


Craig G. Holmes
Reg. No. 44,770

1600 Willow Street
San Jose, CA 95125
(408) 414-1080
Date: April 2, 2001
Facsimile: (408) 414-1076

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Docket #: 49658-0025